

S	ENGINEERING CHANGE NOTICE	Page 1 of <u>2</u>	1. ECN 548339
			Proj. ECN

HN920601

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental <input type="radio"/>	J.C. Henderson, Tank Farm Vadose Zone,	<input type="radio"/> Yes <input checked="" type="radio"/> No	5/20/99
Direct Revision <input checked="" type="radio"/>	HO-22, 372-9234		
Change ECN <input type="radio"/>	6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
Temporary <input type="radio"/>	Preliminary Site-Specific Work	TWRS Vadose Zone	N/A
Standby <input type="radio"/>	Plan Addendum for WMA S-SX		
Supersedure <input type="radio"/>	9. Document Numbers Changed by this ECN (includes sheet no. and rev.)	10. Related ECN No(s).	11. Related PO No.
Cancel/Vold <input type="radio"/>	HNF-4380, Rev. 0	N/A	N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Completed	12d. Restored to Original Condition (Temp. or Standby ECNs only)
<input type="radio"/> Yes (fill out Blk. 12b)	N/A	N/A	N/A
<input checked="" type="radio"/> No (NA Blks. 12b, 12c, 12d)		Design Authority/Cog. Engineer Signature & Date	Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

Table C.1 was revised to reflect an update to the required analytical detection limits.

Page A-8 and C-10 were revised to reflect changes in the number of equipment rinseate blanks.

13b. Design Baseline Document? Yes No



14a. Justification (mark one)	14b. Justification Details
Criteria Change <input checked="" type="radio"/>	Changes required to reflect analytical detection limits for sediment sample media to be obtained from decommissioning of borehole 41-09-39 and the new borehole located near SX-115.
Design Improvement <input type="radio"/>	
Environmental <input type="radio"/>	
Facility Deactivation <input type="radio"/>	Changes required to reduce the number of equipment rinseate blanks associated with sediment sampling activities.
As-Found <input type="radio"/>	
Facilitate Const. <input type="radio"/>	
Const. Error/Omission <input type="radio"/>	
Design Error/Omission <input type="radio"/>	

15. Distribution (include name, MSIN, and no. of copies)	RELEASE STAMP
Central Files B1-07	DOE/RL Reading Room H2-53
Vadose Zone Project Files HO-22	<div style="border: 2px solid black; padding: 5px; display: inline-block;"> <p style="font-size: 1.5em; margin: 0;">JUN 17 1999</p> <p>DATE: _____</p> <p>STA: 15</p> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin: 5px;"> <p style="text-align: center;">HANFORD RELEASE</p> </div> <p>ID: (21)</p> </div>
D.E. Olson HO-12	
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T. Knepp HO-22	

Preliminary Site-Specific SST Phase 1 RFI/CMS Work Plan Addendum for WMA S-SX

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Richland, WA 99352
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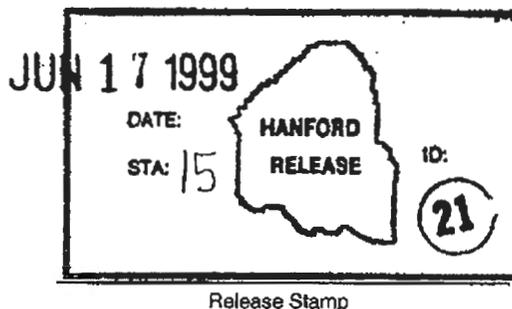
Key Words: Vadose Zone, RFI/CMS Work Plan, WMA S-SX

Abstract: This Preliminary Site-Specific Waste Management Area S-SX Phase 1 RFI/CMS Work Plan Addendum addresses vadose zone and groundwater characterization activities in and near the WMA S-SX. Vadose zone characterization activities associated with decommissioning borehole 41-09-39, installation of a new borehole in the SX Tank Farm near SX-115, and installation of three RCRA groundwater monitoring wells are described.

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Karen A. Roland 6/17/99
Release Approval Date



Approved For Public Release

After the continuous split-spoon sediment samples are screened, the split-spoon samples will be transported to the Pacific Northwest National Laboratory (PNNL) (Applied Geology and Geochemistry group) for analysis. All material removed from the borehole will be sent to the laboratory for possible future analysis. Samples will be contained in airtight sample containers after their initial screening by the health physics technician and are to be kept under refrigeration. This process is used to retain sediment moisture in as close to field condition as possible. At least one of the 15 cm (6-in.) acrylic liners in each sampling episode will be retained without removing the sediments. That liner will be sealed with end caps and further sealed to retain ambient sediment moisture for laboratory analysis. All samples will be transported to the laboratory under refrigeration to further limit alteration of sediment moisture.

Field quality control (QC) samples also will be submitted for the full spectrum of chemical and radionuclide analyses. These QC samples will consist of the following (see Section C.9.0):

- Field duplicate samples: A minimum of 5% of the total collected samples shall be duplicated, or one duplicate for every 20 samples, whichever is greater.
- Field blanks: One blank per borehole drilling activity.
- Equipment rinseate blanks: One equipment rinseate blank per borehole drilling activity or, if multiple types of samplers are used, once per type of sampler.
- Volatile organic analysis (VOA) trip blanks: One trip blank per batch of sample containers shipped to the sampling facility. The trip blanks will be analyzed for VOAs only.

A.3.1.4 Groundwater Sampling Activities (Task 3 of Chapter 5.0)

The sampling of groundwater will be conducted by the Hanford Groundwater Program as described in Johnson and Chou (1999).

A.3.1.5 Field Reporting Activities

Field logs will be maintained to record all observations and activities conducted. A site representative will record the activities on a field activity report per approved WMFS procedures. Items for entry will include the following:

- Borehole number
- Site location drawings
- Drawings of the downhole tool strings
- Site personnel present
- Sampling types and intervals
- Zones noted by the health physics technician as elevated in radiological contaminants
- Instrument readings and the depth represented by those readings
- Specific information concerning borehole completion.

All completed field records will be maintained and processed in accordance with approved WMFS procedures.

Table C.1. Analytical Methods, Analytical Parameters, Detection Limits, and Precision and Accuracy Requirements for the WMA S-SX

Analytical Category	Analytical Parameters	Detection Limit	Precision ³	Accuracy ³
Inorganics	Metals	10-25 ppb	± 20	75-125
	Anions	3-5 ppm	± 20	75-125
Organics	TOC	0.2 wt%	± 20	75-125
	SVOAs w/TICS	Varies	Note 1	Note 1
	VOAs w/TICS	Varies	Note 1	Note 1
Radionuclides	Carbon-14	Unknown	± 20	80-120
	Tritium	5 pCi/g	± 20	80-120
	Strontium-90	40 pCi/g	± 20	80-120
	Radioisotopes by ICP-MS	10 ppb	± 20	80-120
	Gamma-Emitting Isotopes	10 pCi/g	± 20	80-120
Hydraulic and Physical Properties	pH	N/A	Note 2	Note 2
	Cation Exchange Capacity	Method-dependent	Note 2	Note 2
	Particle Size Distribution	N/A	Note 2	Note 2
	Mineralogy	N/A	Note 2	Note 2
	Electrical Conductivity	10 microsiemens/cm	Note 2	Note 2
	Moisture Content	1.0 wt%	Note 2	Note 2
	Matric Potential	N/A	Note 2	Note 2
	Kd	N/A	Note 2	Note 2
	Bulk Density	Method-dependent	Note 2	Note 2
	Moisture Retention	N/A	Note 2	Note 2
	Saturated hydraulic Conductivity	N/A	Note 2	Note 2

Notes:

- ¹ Precision and accuracy related to VOA and SVOA analyses should be in accordance with HASQARD.
- ² Precision and accuracy for these measurements are not required because of the nature of the measurement.
- ³ Precision is expressed as Relative Percent Difference (RPD); accuracy is expressed as percent recovery (%R). These limits apply to sample results greater than 5 times the detection limit. If these limits cannot be met, documentation of this fact must be presented in the data report.

C.4.0 SAMPLING PROCEDURES**C.4.1 PROCEDURE APPROVALS AND CONTROL**

All procedures required for vadose zone sampling activities shall be approved and shall comply with applicable LMHC and/or PHMC procedures. Where WMFS procedures are referenced, the latest approved version shall be used. Procedures to be used for the groundwater sampling may be found in Johnson and Chou (1999).

Field blanks. Field blanks shall consist of pure deionized distilled water, transferred into a sample container at the site and preserved with the reagent specified for the analyses of interest (see Section A.3.1.3). Field blanks are used as a check on reagent and environmental contamination. One field blank shall be collected per borehole drilling activity.

Equipment rinseate blanks. Equipment blanks shall consist of pure deionized distilled water washed through decontaminated sampling equipment and placed in containers identical to those used for actual field samples. Equipment blanks are used to verify the adequacy of sampling equipment decontamination procedures. One blank shall be collected per borehole drilling activity, per type of sampler.

Volatile organic analysis VOA trip blanks. Volatile organic analysis (VOA) trip blanks consist of pure deionized distilled water added to one clean sample container, accompanying each batch (cooler) of containers shipped to the sampling facility. Trip blanks shall be returned unopened to the laboratory, and are prepared as a check on possible contamination originating from container preparation methods, shipment, handling, storage or site conditions. The trip blank shall be analyzed for volatile organic compounds only, as shown in Table A.1. In compliance with standard procurement procedures, requirements for trip blank preparation shall be included in procurement documents of work orders to the sample container supplier and/or preparer.

C.9.2 LABORATORY QC SAMPLES

Unless otherwise specified in approved analytical methods, internal quality control checks performed by analytical laboratories shall meet, where appropriate for the method, the following minimum requirements in conformance with HASQARD.

- Matrix-spike/matrix-spike duplicate samples. Matrix-spiked samples require the addition of a known quantity of a representative analyte of interest to the sample as a measure of recovery percentage and as a test of analytical precision. The spike shall be made in a replicate of a field duplicate sample. Replicate samples are separate aliquots removed from the same sample container in the laboratory. Spike compound selection, quantities, and concentrations shall be in accordance with HASQARD. One sample shall be spiked per analytical batch, or once every 20 samples, whichever is more frequent.
- Quality control reference samples. A quality control reference sample shall be prepared in accordance with HASQARD requirements. Reference samples are required as an independent check on analytical technique and methodology, and shall be analyzed in accordance with specific method requirements.

Other requirements specific to laboratory analytical equipment calibration are included in Section C.6.0 of this QAPjP. The frequency of quality control samples such as analytical blanks is method-dependent; refer to HASQARD for these requirements.